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ABSTRACT

This pamphlet is a collection of ten short articles originally published in "Soil Conservation" from 1964-1968. The articles are written for the teacher and are concerned with recent innovations in conservation education in various schools in the eastern United States. Innovations include school land laboratories, soil monolith tours for teachers, and school site planning and development. A number of outdoor laboratory experiences for students are suggested. A teacher education program involving conservation education is presented. Several conservation education publications are listed. (BB)

REPRINTED FROM soil conservation

Creative Learning Experiences in Conservation

SOIL CONSERVATION SERVICE

U.S. DEPARTMENT OF AGRICULTURE

From the Administrator:

Opportunities in Conservation Education

Basic to continued social, economic, and personal development in all areas of human endeavor is recognition and acceptance by each citizen of his responsibility for rational use and proper care of the entire natural physical environment.

Personal commitment for intelligent use and management of natural resources depends on an appreciation of man's interdependence with his environment and understanding of realistic principles of natural resource use. Such appreciation and understanding can best be developed in children and youth.

Since its inception, the Soil Conservation Service has actively supported and assisted with conservation education efforts on a broad scale. As we witness the continuing movement from farm to city with the resulting disassociation of people from the land, we are impressed with the need for greater emphasis on conservation education in the classroom.

Fortunately, conservation education is coming to be recognized in its proper perspective by teachers and administrators. After 2 years of study, a special commission of the American Association of School Administrators recently identified "to make intelligent use of natural resources" as one of nine "imperatives in education."

The National Conservation Education Association phrases its policy: "We believe that a major goal of education is the recognition by man of his interdependence with his environment and with life everywhere, and the development of a culture which maintains that relationship through policies and practices necessary to secure the future of an environment fit for life and fit for living."

SCS heartily applauds the conservation education efforts of these and other national groups of educators.

Conservation principles underlying intelligent use and management of resources and the technological skills needed to protect those resources have their roots in science. But instruction about conservation must go beyond science classes to become part and parcel of the entire educational process that prepares a student to take his place as a responsible citizen of his community, state, and Nation.

Conservation is as much a problem of people as of resources; the subject needs to be incorporated into the entire social sciences curriculum.

Art, music, and literature all are related to man's appreciation of the natural world, its infinite variety and basic unity. Teachers in every subject matter area have found that they can strengthen the content of their courses by relating them to resources and conservation.

A most effective way of helping children learn about natural resource conservation, especially in densely populated regions, is by using the school site as an outdoor learning laboratory in all areas of instruction. Outdoor classrooms are being developed throughout the country, as places where conservation can be a real part of the learning environment. SCS representatives in every community should seek opportunities to provide technical and consultive assistance in developing these areas to make best use of soil, water, and plant resources as instructional tools that serve a practical conservation purpose.

Ideally, planning for the outdoor classroom should begin during the selection of the school site, for which SCS can provide needed soils information.

It is heartening to note the organization and development in several states of conservation education advisory councils through which much can be done to develop sound conservation education programs. In addition to the important state councils, the efforts in some areas to develop county or school-system councils merit our full support.

Nearly 300 conservation education workshops for teachers are held each summer, and colleges and universities are giving increasing attention to instruction in conservation for teachers. Yet, the prime need today is for means for teachers to acquire the knowledge about natural resources and conservation that they must have if they are to provide meaningful conservation learning experiences for children. Our efforts in conservation education are multiplied many times over when, as trained conservationists, we help teachers learn about conservation.

The task of teaching conservation is the responsibility of the teacher, just as farming is the business of the farmer. And, similarly, it is the responsibility of the professional conservationist to provide aid to conservation educators just as it is to provide technical help to land users.

The Soil Conservation Service holds conservation education to be of highest importance, for only a conservation minded people can and will commit themselves to intelligent use, development, restoration, and preservation of our heritage of renewable natural resources.

D. A. Williams

From SOIL CONSERVATION 33: 287. July 1968.

Land for Learning

By Robert R. Finlay

Education consultant, Ohio State Department of Education, Columbus, Ohio

On school land laboratories, children get to know the out-of-doors OUTDOORS

Many communities have within their boundaries some potentially fine outdoor education areas. What is more, most facilities can be made operative at relatively low costs.

Excellent learning opportunities may exist on either the planned or unplanned portions of a school site. The undeveloped parts of a property generally offer the best terrain for establishing instructional programs. But lawns, landscape plantings, patios, courts, and playgrounds also can be integral parts of the total plan.

Any plot of land

It takes much planning and much cooperation to attain full use of an outdoor laboratory, but the efforts are certainly within the capabilities of most teachers and school administrators.

What, then, is a "school land laboratory?"

It can be any property controlled by the board of education that is readily accessible to students and that may be used to enrich learning about soil and water relationships and plant and animal life. These areas have been referred to as "lands for learning," and the like. In Ohio the term "school land laboratory" has wide acceptance by educators.

A land laboratory may vary in size from a small area close around a school building to an expanse of many acres. One urban elementary school developed an excellent program on a plot that measured 39 by 49 feet. A few rural consolidated schools have areas in excess of 100 acres for laboratory use.

Let us assume that a school has some available land and that there is evident interest in such a project on the part of the school board, administration, and teaching staff.

Experience has shown that the first step should be a preliminary site study. This might best be done by a team which would include an outdoor education specialist, a naturalist, a technician in soil and water management, and a local school administrator. A favorable written report from this group would serve as a basis for additional detailed studies for specific areas; e.g., ponds, marshes, woodlands, old fields, fence rows, and the like.

Preserving natural features

On a newly acquired site it would be highly desirable to work with the architect to preserve a maximum of natural features. Unfortunately, the preservation of these educational resources is usually given little consideration by engineers and architects. As a consequence many excellent school land laboratory sites have been destroyed during construction periods, or, if not obliterated, extensively damaged.

Land laboratories can be used by pupils and teachers at all grade levels. There are usually opportunities for nature study, for observing the effects of plants and animals on each other, for growing plants, and for many kinds of experimentation. All of this can be coupled with developing an appreciation for the out-of-doors.

What mysteries are exposed where the water meets the land! Fortunate is the school that has its own little pond.

Plans for larger sites, especially those adjacent to secondary schools, often include nature or conservation trails, wildlife areas, ponds, woodland management areas, Christmas tree plantations, and other resource-based projects. Possibilities are unlimited if administrators and teachers are aware of the values of outdoor education.

In a recent study of a 150-acre site at a rural consolidated high school, it was found that surface drainage was creating severe erosion problems and that proposed playing fields were being placed on bottom land near a small creek. At the time of visitation, no plans had been made to handle excess water on the area. Now, a complete soil and water conservation plan for the entire property is being prepared with the assistance of the Soil Conservation Service. Preliminary studies indicate that some diversions will be constructed, a spring will be developed, streambanks will be improved, a small shallow pond will be created, and a larger pond of greater depth will be established. The drainage problems of the school ground will be solved by the planned conservation work. Although some of the work will be done under contract, much can be done by students in the vocational agriculture and biology classes.

What will these changes mean in terms of outdoor educational experiences?

It is planned to have students in the advanced mathematics classes work with the technicians and engineers in doing some of the necessary surveying.

The vocational agriculture boys are building the diversions, developing the spring, and establishing contour strips on the cropland area.

The biology classes will obtain laboratory material from the shallow pond. They will initiate long-term studies on the growth and control of aquatic plants and fish populations in the deeper pond. This impoundment will also serve as a source of water for irrigating the playing fields during prolonged dry spells.

Other suggestions for development of the land laboratory include a limited Christmas tree plantation, some reforestation on an open hillside, a timber stand improvement project in the wooded tract, and the improvement of wildlife habitat. These projects will be done in cooperation with state forestry and wildlife personnel.

Under proper guidance the biology students will plan and develop a nature and conservation trail. A local sportsmen's group has indicated a willingness to provide funds to construct an outdoor classroom at an appropriate spot along the trail, and a Boy Scout troop has offered to construct three small bridges that make parts of the laboratory easily accessible. This type of involvement is highly desirable in maintaining school-community relationships.

Conservation deals with the management of land, water, minerals, plants, and animals. Consequently, many learning experiences in conservation are best provided out-of-doors where the resources exist.

Unless schools make some provision for real work with natural resources, many children will never have firsthand conservation experiences. The development of a school land laboratory offers a practical and inexpensive way to meet these needs. ♦

Two high school girls get experience with compass and increment borer on a forest growth study plot.

From SOIL CONSERVATION 33: 267-268, July 1968.

Michigan schools put real action into conservation education

By James A. Miller and Palmer G. Skalland

Director of outdoor education, Coldwater Public Schools, Coldwater, Mich., and state soil conservationist, SCS, East Lansing, Mich.

With outdoor classrooms now on at least 287 Michigan school grounds, very few of the State's young people will finish public school without some introduction to conservation of natural resources.

Students in many schools can just step out the door and see conservation in action. Some of them can look out the window and see a tiny watershed protection program doing its job.

To plan it that way, schools become soil conservation district cooperators like any other landowner and receive onsite technical assistance from the Soil Conservation Service.

SCS State Conservationist Verne Bathurst has instructed fieldmen to adapt conservation planning on school grounds to meet specific teaching needs. In most instances, it is possible to provide examples of a wide variety of conservation practices that demonstrate the intelligent management of resources.

A model watershed

Lincoln Elementary School at Coldwater is a good example. The school was built next to 117 acres of park and fairgrounds. The builders used some excess excavated soil to build a small model watershed—complete with detention dam, diversion, and grassed floodway. Water coming off the roof and the lawn was directed to put on a show for the children watching from beneath the roof overhang. The backslope of the dam has been treated as a wildlife habitat.

Carlo Heikkinen, superintendent of Coldwater Public Schools, and Hale Pearce of SCS, who assisted with the overall plan, say the acre-and-a-half watershed is even better than a full-sized one for showing pupils how water-control measures function. Others who assisted with the plan were Jerry Fair, the school architect, James A. Miller, director of out-door education, and school board members, together with local Soil Conservation Service personnel.

The plan included:

(1) A diversion of the water from the school building.

(2) A stone-lined waterway, built by students, to carry the water to a 4-foot lower level.

(3) Grass plantings on the lawn which had been reshaped.

(4) A diversion terrace to divert water from the upper school ground to a catch basin 6 feet below and over a grassed waterway leading to a cement block erosion-control structure at the river.

(5) A gradient terrace on the lower school ground to break up the slope and prevent erosion.

Additional plans for outdoor classes at Coldwater include some phases of the entire curriculum. These may include a sundial for time studies, a hole in the lawn for soil profile studies, a history chart using the sidewalk as a scale of years, or a United States map painted on the parking lot.

Another example is at Ann Arbor High School where the conservation classroom covers 27 acres. Ten acres is in woods that are laced with nature trails. There is also a pond. One open area was kept as a farm field and treated with stripcropping and contour farming. Dr. Bill Stapp is the prime mover for the project. He is also a conservation education consultant and a professor for the University of Michigan's School of Natural Resources.

Not every school, however, can have a park next door, a watershed on the grounds, or a 27-acre site, but nearly every school has a little space. The Fletcher Elementary School at Ypsilanti has less than an acre, but it boasts autumn-olive plantings, multiflora rose, plots of grass, and a drainageway.

If students and teachers want to look further into conservation, the Kalamazoo Nature Center has 500 acres where busloads of young citizens can see everything from tropical plants to terraces. Students from

A gradient terrace gives the school grounds protection from erosion and the students a demonstration in conservation.

Students from Coldwater Public Schools visit a seedling pine and spruce nursery used in developing an outdoor laboratory.

about a 40-mile radius are regular visitors, but they come from all over the State at times. Last year 30,000 students visited trails with well-marked conservation practices, soil formations, plant species, and natural wilderness. Supported by endowments, membership fees, and service charges the center offers conservation education ranging from outdoors appreciation for first graders to training for teachers.

Training for teachers

Best of all, the school forces in Michigan are squarely behind conservation education. The universities include courses for teachers. The State Department of Education has a full-time outdoor education consultant in Al Dighera. He will serve as recording secretary for the committee on conservation education, made up of teachers, educators, and conservationists.

Groundwork was laid several years ago by Benjamin E. S. Hamilton, a curriculum consultant for the State superintendent's office. He serves as permanent secretary to the Conservation Education Committee which meets several times yearly to provide the curriculum leadership in conservation education. SCS is a member of this committee and is represented by the state soil conservationist.

Eastern Michigan University at Ypsilanti has a 6 weeks' summer shortcourse for teachers called the Biology, Earth Science, and Resource Use Institute. Dr. Lawrence Ogden, associate professor of geography, and his associates choose from 200 or more applicants to fill the 35 spaces each year. The National Science Foundation sponsors the institute and provides scholarships to those who attend. Last year teachers from 22 states came for the study.

John Trustdorf, SCS work unit conservationist at Ann Arbor, is one of many SCS people throughout the state who takes the group on field trips.

The Higgins Lake Conservation School, a summer camp for teachers, is another meeting which attracts a full house each year. The Michigan Conservation Department sponsors the school.

Two things make Michigan a leader in conservation education. First, by including it in the curriculum, the State Department of Education, universities, and public schools lay the framework for teaching conservation.

Next, the teacher is given the know-how and the facilities for teaching. Courses in conservation are available, and a site for studying the natural world and conservation principles has been provided near at least 287 school grounds. With a little support and technical help from SCS and conservation district people, the teaching is done by trained teachers on a do-it-yourself basis.

In this way, a new generation of land users learn conservation in a state that believes in conservation and acts on this belief. ♦

New publications

Sediment—It's Filling Harbors, Lakes, and Roadside Ditches. *1967. USDA Agr. Inf. Bull. 325. 16 pp., illus. $0.15.* The bulletin states that there is no longer any doubt that erosion and sedimentation are many times as costly as soil conservation and presents data to support this conclusion. It supersedes Agr. Inf. Bull. 174, "Sediment Is Your Problem—Wasted Soil and Water."

Sediment is a national problem. It damages crops and cropland, reservoirs and ponds, roads, railroads, and navigation channels. It causes more frequent floods and hurts recreation and public health. Sediment comes from farmlands, riverbanks, roads, construction sites, and industrial and mine wastes.

Some of the practices to reduce sediment are contour farming, terracing, contour stripcropping, controlled grazing, returning steep cultivated land to woods or pasture, and stabilizing stream channels. Builders can control sediment by providing temporary cover, such as annual grasses and small grains, or sod, mulch, burlap, or plastic.

This booklet pictorially shows examples of the problems and its remedies.

Conservation and the Water Cycle. By Soil Conservation Service. *1967. USDA Agr. Inf. Bull. 326. 8-page folder, illus. $0.10.* The water cycle is an endless process of water circulation going on throughout the world. The colored diagram in the folder and the description of the hydrologic processes that affect the earth and its inhabitant trace the movement of water through the cycle. A 40- x 28-inch color reproduction of the diagram is for sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402 for $0.35.

From SOIL CONSERVATION 33: 271-272. July 1968.

Kindergarten pupils study a box turtle near the "central Jersey stream," part of the school's outdoor lab.

Outdoor Laboratory Builds Interest in All Studies

By Erling W. Clausen
Superintendent of Schools, Freehold, N. J.

NATURAL areas are becoming an accepted part of school life in the United States.

Because they stimulate interest not only in the sciences but in all studies, because they engender fresh enthusiasm among students and teachers, many school boards include natural areas in their plans for new buildings. That means that certain parts of the school's grounds are set aside and kept intact, out of the path of bulldozers.

The natural areas then become an actual part of the school—an outdoor laboratory in which the students can see, feel, hear, smell, and even taste what they study in the classroom. The advantages of such a laboratory are obvious.

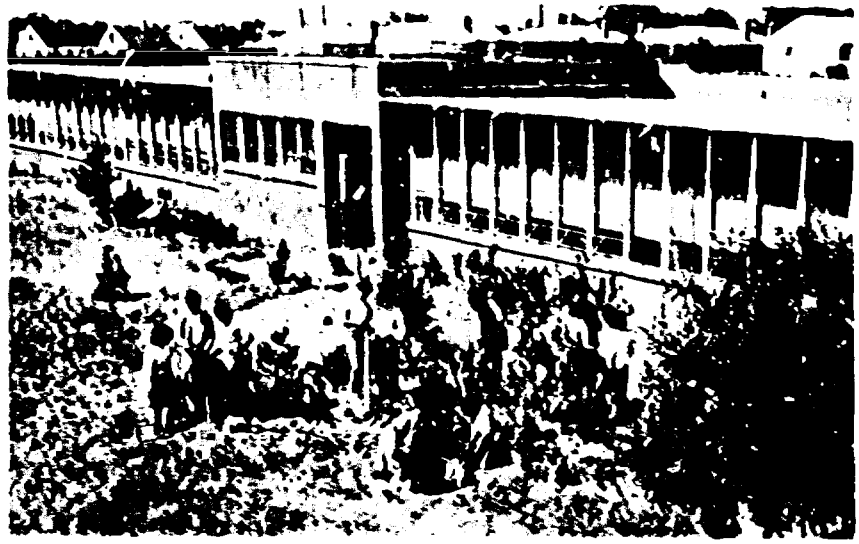
But many if not most of existing schools were built before the value of natural areas to students and faculty had become evident. Some school boards have tried to overcome this deficiency by acquiring tracts of land in their natural state. Generally these tracts have the disadvantage of being miles from the school. Use of them usually amounts to no more than a quick tour. To render its fullest value, a natural area must be part of the school grounds so that it can be used quickly, easily, and at will by students and teachers.

Manmade Study Area

Does this mean, then, that nothing can be done for schools that were built without preserving part of the grounds as a natural area? No, I don't believe so. The handicap can be overcome by establishing an artificial, manmade "natural" area. It can serve almost as well as a genuine natural area.

That has been our experience at the Intermediate School in Freehold, N. J. We have established a miniature, simulated "natural" area that has proved so successful a part of our teaching process that we are planning to enlarge its scope—by degrees.

Naturally enough, the idea for our outdoor lab came from Neal Munch, a professional and dedicated work unit conservationist for the Soil Conservation Service in the Freehold Soil Conservation



Eighth grade students identifying plants, checking rain gage, and measuring tree growth in the "pine barrens of south Jersey" part of the outdoor laboratory.

District. At the time, he was a member of the school board, later its president. In blueprinting the outdoor lab, he had the help of Marvin A. Clark, Monmouth County agricultural agent, and Raymond Korbobo, extension specialist in landscape design at Rutgers University. The New Jersey Division of Fish and Game has also been an interested helper in the development of our outdoor lab from the beginning.

The planners set up the outdoor lab between two wings of the school building. A high wire fence protects the area at the open end.

Resource Areas Shown

An advantage of our manmade "natural" area is that it represents various land resource sections of the whole State. The actual soil and vegetation were brought from their natural areas. In carrying out this chore, on his own time and after school hours, Mr. Munch was assisted by some of our older students and Harold G. Smith, our 8th grade science teacher.

Begun in 1962 before I became school superintendent, our outdoor lab now consists of miniature reproductions of several New Jersey land resource areas, 200 different plants, 28 types of animal life, and 2 ponds.

From kindergarten to 8th grade, students have the opportunity to observe turtles, frogs, rabbits, fish, water and land insects, and microscopic life. Other objects of study are the many birds attracted to the area by feeders and houses built in the school shop for their use.

Firsthand Knowledge

"Without the outdoor lab," Mr. Smith points out, "the students could obtain their knowledge only from books and similar material. That's not enough. With only book knowledge, a student could get lost, literally and figuratively, in a genuine natural area. Here it's just a step to our outdoor lab where the students can learn things first hand, or confirm what they have read or heard in the classroom. An outdoor lab has a tremendous potential as a teaching tool. Ours will be used to an increasing degree as we enlarge its scope."

In the outdoor lab, our students learn about the relationship of plants and animals to their environment. The conservation of natural resources is an important part of the general study. Specific subjects include the study of plants, such as the identification of flowers, shrubs, and trees, and of insect damage to plants. Long-range projects include the study of erosion and the rate at which plants grow. Observing erosion at close range, the students can then understand how rain falling on bare land can wash priceless topsoil from unprotected yards and farm fields into reservoirs, streams, and harbors.

It took only about $500 cash outlay to establish the outdoor lab. The $300 fence was the largest item. Sand cost about $25 and plants about $30. Most of the sand and many of the plants, however, were obtained free for the digging.

Gail Furniss, 8th grade, examines a robin's nest in a red cedar tree in the "central Jersey" section of the outdoor lab.

◆

Moisture in depths down to 4 feet should be considered in planning fertilizer rates for most soils.

◆

Grassed waterways carry flood runoff safely from terraced and contour-cropped fields and from roadways and airports as well.

From SOIL CONSERVATION 30: 82-83, November 1964.

Student teachers join in district program to give children the facts of conservation

By Barbara Restle

Supervisor, Monroe County Soil and Water Conservation District, Bloomington, Ind.

A pilot program that gives a continuing conservation education to children from the first to seventh grade has been started by the Monroe County Soil and Water Conservation District in Indiana.

Student teachers from Indiana University in Bloomington and other volunteers in the district help teach the 1-hour-a-week classes.

District supervisors initiated the program, the first of its kind in Indiana, at Washington Township Consolidated School in Bloomington. The student teachers are fulfilling requirements for a degree in elementary education under Professor Prevo Whitaker of Indiana University, who is also secretary-treasurer of the district.

Professor Whitaker, Wayne Fix, SCS work unit conservationist, and the author held meetings with the Washington school principal, teachers, and others to develop plans for the course.

A custom-tailored course

The course may touch on any phase of man's relationship to his natural environment, from how the White River got polluted to how many trips in 12 hours a bird makes away from her nest hunting insects.

The conservationists assisting with the program make an effort to custom fit the subject matter to specific age groups, giving the teachers opportunity to carry conservation into many areas of study.

The fifth grade has integrated a new science program with conservation interests by experimenting in making soil. They observe what happens when leaves, sand, and fertilizers are mixed and let stand for a period.

The sixth grade has been given many class hours of instruction on land use. During one session, a conservationist discussed land capability and explained why some of the "hills and hollows" of southern Indiana are not suitable for farming.

All the classes have field trips to see actual examples of the things discussed in lectures. All 220 children were taken to their new school site in four shifts. The older children were put to digging a 2-foot-deep hole to obtain soil samples at various depths and see the differences between topsoil rich with organic matter and the deeper subsoils and parent materials. Earlier in the semester all the students had run the experiments in growing peas or corn in topsoil and subsoil and to observe the health of the plants.

All the classes also planted conifers to serve as a windbreak for the future playground. Three sink holes on the new school site were inspected, and students learned that sink holes and caves are a natural feature of limestone country.

During the spring semester Joe Lamendola, biologist of the Indiana Department of Natural Resources, spoke to a large group of students about the needs of wildlife.

Ned Woodward, Monroe Lake conservation officer, spoke about migrating birds and told how special areas in the new reservoir have been designated off limits to power boats to insure resting and breeding places for ducks.

A state forester, John Datena, led student groups into wooded areas identifying trees and explaining plant succession. The forester showed how to estimate the height and board feet of trees by using a tree-measuring stick.

The regular teaching staff at Washington School was encouraged to introduce conservation ideas into their classes in art, math, biology, geography, and history. For the first three grades, art projects proved most meaningful in putting across concepts in conservation.

Teachers had the benefit of a wealth of educational materials from such sources as the Massachusetts Audubon Society, National Audubon Society, the Soil Conservation Society of America, Boy Scouts of America and the Soil Conservation Service.

The Washington Township Farm Bureau donated $75 for a conservation library, and a portable library rack was built to hold the books. The new library includes information on the precarious balance of nature, mammals and birds, geology, and water. To broaden the picture for the midwestern child, a few books deal with arctic and tropical wildlife and conservation problems.

Awareness of resources

The goal of our district is to give students an awareness of natural forces at work in the land. Hopefully, the conservation classes will encourage better citizenship by developing a deeper understanding of natural resources.

Professor Whitaker says, "We must always take advantage of new ways to use our knowledge to help deal with the growing scarcity in world resources. In our community we have had many willing citizens to help us along our way. We started with the supervisors of our district contacting school administrators and enlisting the help of qualified technical personnel and talented local citizens. During the entire semester I can't remember anyone turning down our request for assistance." ♦

From SOIL CONSERVATION 33: 275. July 1968.

Mississippi advisory council enhances agency cooperation in conservation education

By W. L. Heard [1]

State conservationist, SCS, Jackson, Miss.

Mississippi has traded its "scatter gun" approach to conservation education for a "concerted cooperative approach" with the formation of a State Conservation Education Advisory Council.

At the invitation of J. M. Tubb, state superintendent of education, representatives of state and Federal resource-use agencies, schools, and other groups met in Jackson in May 1967 to form a council to work with Department of Education officials on matters pertaining to conservation education.

We agreed that the council should: (1) Draft a constitution and bylaws; (2) define its purpose; and (3) establish immediate and long-range objectives.

Committees were set up to accomplish these assignments, and at a November meeting the council adopted these documents, elected permanent officers and a steering committee for 1968–69, and expressed their views about priority of objectives.

Immediate action

One of the immediate steps was to write the gubernatorial candidates and the incoming state superintendent of education, emphasizing the need for a full-time staff position in the State Department of Education with primary responsibility in the field of conservation education.

Other immediate-action objectives include expansion of summer workshops for teachers and a list of services and material available to teachers from the resource agencies.

Many interested persons have asked us to outline the steps through which the council was formed. In our experience, two key factors stand out:

(1) It is important for any group or agency, seeking to strengthen conservation education in the schools, to realize that the state superintendent has the responsibility for the public school curriculum and education program at elementary and secondary levels.

(2) No single resource agency is in a strong position to sell "conservation education" to the State Department of Education. Educators very much prefer to consider the total resource picture.

Mississippi is fortunate to have the persistent and enthusiastic leadership of P. D. Houston, chairman of conservation education and publicity for the Mississippi Association of Soil and Water Conservation District Commissioners. This group is in an objective position; it has the prestige of lay leaders, and can coordinate the efforts of many other groups.

Groundwork

Over a period of years, Mr. Houston has developed an excellent rapport with the State Department of Education and educators.

In 1966, with responsibility for a conservation education panel at the state association meeting, Mr. Houston included the following educators: A. P. Bennett, director of the Division of Instruction, and R. C. Roberts, state science supervisor, State Department of Education, and Peter Green, principal of Canton Elementary Schools. Also on the panel were David Kistner, Snellville, Ga., chairman of the NACD Education Committee, and Mrs. Hugh Norman, Sr., Summit, Miss., president of the Association's Ladies Auxiliary.

The panel provided an opportunity for these individuals to exchange ideas. Perhaps its most important accomplishment was psychological. Because the representatives for the State Department of Education were speaking their thoughts about conservation education, they were not just listening. They were supporting conservation.

As a result of this meeting, Mr. Houston and representatives from the SCS met with the Department of Education officials to discuss what might be done.

It was not long before the state superintendent of education agreed to take the lead in calling a meeting for the purpose of organizing a council, and we in the Soil Conservation Service were happy to provide some help with planning the initial meeting and suggesting some people to be invited.

We believe the council will provide the concerted cooperative approach to solve conservation education problems. ♦

USDA resource conservation

A large part of the land and water resources of the United States are privately owned and operated under the laws of the 50 States. USDA has the major responsibility for cooperative programs with the States to conserve, develop, and manage soil, water, grass, forest, and wildlife habitat on private lands. These programs include research, education, extension, technical, credit, and financial assistance. On the National Forests and National Grasslands, USDA administers a multipurpose program of resource management. ♦

[1] Mr. Heard is chairman of the Mississippi State Conservation Education Advisory Council.

From SOIL CONSERVATION 33: 279. July 1968.

Students like soil monolith tours

By Bruce G. Watson
Assistant State soil scientist, SCS, East Lansing, Mich.

Have you ever taken anyone to the field in quest of miniature soil monoliths? If not, you and those interested in conservation have missed a rewarding and educational experience. One science teacher, who recently attended a soil monolith tour, commented, "This is the first time I have really understood the difference between soils."

During the past summer, science and agriculture teachers, conservationists, county agents, and others participated in soil monolith tours in Michigan. On these tours, usually arranged by the Soil Conservation Service, each person prepared monoliths of eight of the major soils in the county and by so doing became thoroughly familiar with the soils.

This was the first time many participants had seen the real "business part" of a soil—that is, the part below the surface layer.

Eight sites were selected for each tour. At each site an SCS soil scientist briefly described the nature and limitations of the soil. He passed out a soil interpretation sheet for each soil that further explained the degree and kind of limitations of the soil for farm and nonfarm uses. By the time the tour ended the people were using and knew the meaning of terms such as "soil structure," "permeability," "drainage," and the like.

An SCS soil scientist compares eight soils for these agricultural workers. This group made 48 such soil monoliths of eight different soils in 1 day.

Miniature soil profiles are easy to make. First, sample each layer of a soil profile with a special cutter. Cutters of different sizes are used so as to give a sample one-fourth actual size of the layer in the soil. For example, a 3-inch cutter is used to sample a 12-inch layer.

Next, put each sample into a 12-inch long, 2-inch wide, and 1-inch deep wooden tray in the same relative place it occupied in the natural profile. Even though only one-fourth actual size, the finished profile is true to scale.

Finally, pour a clear plastic solution, such as vinylite dissolved in acetone, over the surface of the profile. This solution hardens and cements the soil into the tray. Paint the trays white and you have an attractive model of a soil from your county.

Scale model soil profiles are lightweight and compact and are easier to carry than the full-size profiles. You can arrange the profiles, along with pictures, into a large variety of displays. The soil profiles are good visual aids for teaching, meetings, television programs, fairs, and field days.

"These profiles will sure make teaching about soil resources easier," commented one young science teacher, who later used the soil profiles and the soil interpretation sheets in several classroom exercises. ♦

From SOIL CONSERVATION 33: 113. December 1967.

Proving a point . . .

The great outdoors is the greatest teacher

School folks down in St. Martin Parish, La., have developed a model 9-acre outdoor education center where students take advantage of nature's handiwork to learn about ecology and resource conservation. The project is so popular that the local school board is already looking for room to expand.

Jeff DeBlanc, St. Martin Parish High School curriculum supervisor, explains it this way:

"Back in 1962, Robert Daspit and I were teaching science at St. Martinville High School. We realized a need for outdoor study. The school board owned 40 acres that was being developed for playgrounds and other school activities. Through Superintendent L. H. Boulet, we persuaded the board to leave 9 acres for outdoor nature study. About that time, the Elementary and Secondary Education Act of 1965 became law, opening up new opportunities for Federal financial help with such projects. We applied for an operational grant of funds under Title III of the act."

Call for help

DeBlanc did not wait for approval to begin work on his pet project. He turned to resource agencies for information to support the proposal and, more importantly, to get the work started. Among the first agencies contacted were the Grande Coteau Ridge Soil and Water Conservation District and the Breaux Bridge work unit of the Soil Conservation Service.

Plans to develop the outdoor classroom called for several things. First of all was a soil survey by SCS soil scientists; then a plant, forest, and wildlife survey by the Louisiana Forestry Commission, Louisiana Wild Life and Fisheries Commission, and SCS working together. The SCS people assisted in locating trails through the area, determined elevations, and designed and staked out a pond. A slough was improved for aquatic plant and animal study.

"By the time the project was approved for Title III funds in 1966, and the first grant of $170,000 allotted, the project was well underway," DeBlanc said. "We immediately put the money to use for outside fencing, roads, buildings, scientific equipment, and labor."

Nature study area

The area is densely covered with vegetation, excellent for nature study. Dr. John Thieret of the Biology Department, University of Southwestern Louisiana, in Lafayette, has identified more than 150 species of grasses, forbs, shrubs, and trees on the area. More than 12 dozen species of animals roam the "classroom," and countless aquatic plants and animals live in the pond and other water areas.

Each of six high schools in the parish has its own plot at the classroom site to study plant, animal, soil, and water resources. Three buildings are equipped with up-to-date equipment for outdoor study in biology, physics, and earth science. There is a closed circuit TV with cameras focused on designated spots for animal study.

The outdoor classroom is developed for three phases of study: 80 percent for biology and ecology, 10 percent for earth sciences, and 10 percent for physics. Math students use the area to solve problems involving calculations of distance, area, and volume of natural features.

Time for study

Time spent by students at the outdoor classroom is scheduled as a part of planned study. Generally 8 to 10 days are spent at the area during a 36-week course. More than 2,000 parish students use the outdoor facilities each year, plus several hundred out-of-parish students and other youth groups. One plot is set aside for local garden clubs and Boy Scouts. Another area is designated for artists. There is also a planetarium and an observation tower.

An additional grant of $80,000 of Federal funds is due in 1968. "This money is already earmarked to develop a lagoon on nearby Bayou Teche, to buy a bus to transport students to and from schools, and perhaps to obtain a full-time teacher with a degree in biology and education," DeBlanc said.

Other plans call for putting in a walk-down trench to study soil profiles and planting a number of introduced plants for study.

DeBlanc and other parish school people see many values in their outdoor classroom. An important one is that the discovery method of teaching is generally more meaningful to all the students. Another is the stimulation for learning among students whose grades have been lagging.

"We all see a need to expand even now," DeBlanc says. "I think we are proving a point: The great outdoors is one of the greatest teachers."—S. B. GAUTHIER, *work unit conservationist, SCS, Breaux Bridge, La.* ♦

Conservation Plantings . . . Invite Birds to Your Home. *1968. USDA PA-840. 16-page illustrated folder in color.* $0.20

Bird's appetites lean toward "berried treasure," and their favorite berries are usually bright-hued and decorative. Their needs for shelter are met by hedges and other dense shrubbery that can fit handsomely in the backyard scene. Trees for songbird concerts and nest building also provide welcome shade and ornamentation for the human householder. The sylvan pool or pond built to serve the wildlife community also serves as a recreation area. Some of the plants listed in the folder are: Amur honeysuckle; crabapple; firethorn; autumn olive; holly; silky gray-stemmed, redosier, and flowering dogwood; highbush blueberry; sumac; cherry; mountain-ash; hawthorn; redcedar; American cranberrybush; bittersweet; tatarian honeysuckle; and Virginia creeper.

From SOIL CONSERVATION 33: 278. July 1968.

Learning to teach about resources . . .

Training sessions help teachers to take conservation into their classrooms

By Frederick E. Bubb
Work unit conservationist, SCS, Allentown, Pa.

Several times a week your office phone rings and a voice says, "I'm a teacher and we're starting a unit on conservation. Could you come out and speak to the class? Could you make it for a half day? I really don't know much about conservation."

Soil Conservation Service employees of the Allentown, Pa., office discussed this matter with directors of the Lehigh County Soil and Water Conservation District and representatives of the district's other cooperating agencies. They found that the other agencies were having the same problem of too many requests and too little time to fill them.

The problem appeared to be that many school teachers have little training in natural resource conservation. They are at a loss, therefore, when called upon to include some attention to conservation in their classes in the traditional subjects taught in elementary and secondary schools. It is then that they call on the conservation agencies for help.

Teach the teachers

The district directors and conservationists concluded that the solution would be for the professional conservationists to educate the teachers so they would feel qualified to teach the subject.

How could this be done? They decided to start at the top. They went to Dr. William Bartholomew, county superintendent of schools, and to Henry Messinger, head of science education for the Allentown schools. They found both men enthusiastic about setting up a teacher-education program in conservation.

The first all-day training session was held at Camp Horseshoe in the fall of 1964. Forty-five teachers from the Allentown schools attended. The following year, 100 teachers from the county schools took part. From now on, all-day outdoor training sessions are to be held—one in the fall at Camp Horseshoe for 110 county teachers, the other in the spring for 70 Allentown teachers. The latter is held at the city of Allentown fish nursery along Little Lehigh Creek.

The program is now well established. The Lehigh County District sponsors the program, and local "talent" does the teaching.

At each session, the first hour is devoted to lectures. Grant White, head of the Lehigh County Cultural Center and a former science teacher, presents an illustrated talk on the materials available locally for teaching about natural resources. Miss Ethyl Evans, a Parkland High School English teacher, tells how she uses conservation in her classes. Her point is that conservation does not have to be limited to science classes. She also uses the out-of-doors for teaching because she finds that her students are motivated more in this environment.

Rotating sessions

The teachers are divided into four groups and attend four training centers on a rotating basis. These are operated by local personnel of SCS and Pennsylvania's Game Commission, Fish Commission, and Department of Forests and Waters. All instructors strive to keep the sessions informal.

For proper environment, the

Grant White, head of the Lehigh County Cultural Center, explains plans for the future in a section of Parkland High School's outdoor conservation laboratory. This part of the laboratory is an abandoned iron-ore mine.

From SOIL CONSERVATION 33: 62-63. October 1967.

training centers are located in areas that have a stream, an open field, and woodland.

If demand is a guide, the training sessions are a success. For last fall's sessions, for example, more than 300 county teachers applied.

The Lehigh County District also sponsors a 5-day "in-service" program in cooperation with the office of the county superintendent of schools. This detailed training program is designed as a follow-up of the 1-day training sessions. For the first 4 days, specialists of one agency each day take the teachers to the field for practical experience in resource education. On the final day, a session is conducted in an outdoor environmental laboratory. This session gives the teachers suggestions on how to use the training they have received.

What is the program's future? The county has 1,800 teachers and the city of Allentown, 1,700. Both groups hope to have every teacher attend at least the 1-day session.

Six of the 10 school districts now in Lehigh County have established or are establishing an outdoor conservation laboratory. These vary in size from a few to 48 acres. Two are at elementary schools. Three are located at the high school, and one serves both elementary and high school. All are being established with student labor, much of it during school hours as a part of instruction.

In addition, about 500 teachers in Lehigh County now have a better background in conservation and will be more willing to teach conservation.

Those phone calls for classroom instruction are decreasing. ♦

Lessons in hydrants and dandelions

The most valuable "equipment" to carry on an effective outdoor conservation program is a teacher who knows how to open the door. It doesn't take dollars to establish an outdoor conservation laboratory; it just takes common horse sense.

For example, hydrants in the city usually have moisture at their bases where grass can be found, perhaps even dandelions. Many things can be learned from an old fireplug, such as:

Where does the water in the hydrant originate?
Why do we have hydrants?
Where did the dandelion come from?
Why is the grass green?
What happens to dandelions in winter?

Children, especially, must be led to discover—be stimulated to inquire—and helped to develop a sense of wonder. We must begin with the kindergarten and increase this type of teaching to develop informed adults.

Sometimes we have a tendency to think that it takes acres and acres of field and forest to teach ecology and conservation properly, but the truth of the matter is that all this can be accomplished within a limited area. Remember, "in most schools it should be necessary to travel no more than three times the length of a desk in order to see examples of many things that are worth observing."

Our natural resources are endangered; let's train the coming generation so they can make amends for our mistakes.—MERCER COUNTY SOIL CONSERVATION DISTRICT NEWSLETTER, *Trenton, N. J.* ♦

Imperatives in Education. By AASA COMMISSION ON IMPERATIVES IN EDUCATION. *1966. American Association of School Administrators, Washington, D. C. 180 pp. $6 (discount on quantities).*

After 2 years of study, a special commission of the American Association of School Administrators has identified nine "imperatives in education." These are explained, and reasons for their selection are given in separate chapters of this book.

Clearly and concisely stated, the imperatives are designated as "points at which the educational program must be revised and reshaped to meet the needs of the times." They are:

To make urban life rewarding and satisfying.

To prepare people for the world of work.

To discover and nurture creative talent.

To strengthen the moral fabric of society.

To deal constructively with psychological tensions.

To keep democracy working.

To make intelligent use of natural resources.

To make the best use of leisure time.

To work with other peoples of the world for human betterment.

It is especially significant that one of the imperatives selected by AASA is "To make intelligent use of natural resources." For far too long education about natural resources, and particularly education concerning their use and conservation, has been regarded as an appendage to or something apart from the regular school curriculum. Here is solid evidence that school administrators are coming to consider imparting knowledge essential to the wise use of natural resources on a par with the traditional facets of the school curriculum.

Though prepared specifically for school administrators and educational leaders and already placed in the hands of more than 18,000 such people, this work should be of great interest to and can be read with profit by anyone seriously concerned with education of youth.—WALTER E. JESKE, *Information Division, SCS.*

Solving Playground Problems Part of District Program

By George S. Brown
Work Unit Conservationist, SCS, Malone, N.Y.

SOLVING the playground problems of the Central School helped the Chateaugay, N.Y., people realize that the district conservation program is for the assistance of all landowners, not farmers alone.

The school was bothered by two problems on its new playground.

The grounds stayed wet late in the spring and after every hard rain. Children got wet feet, tracked in mud on the school's new floors, and made a mess of the struggling lawn.

The other problem was a wide hedgerow interlaced with rusty barbed wire and other hazards such as broken bottles and sharp stones. The school board was worried about this condition, especially after a call from one of the mothers that her boy had been scratched by the wire.

The school principal, Maynard Pilling, asked the Franklin County Soil and Water Conservation District for help. SCS soil conservationists suggested a conservation plan. It included 300 feet of diversion to intercept surface water and carry it safely away from the playground. It had a 700-foot outlet.

The hedgerow was first cleaned out, the valuable trees kept, and low spots on the school grounds filled.

Armand Trombly, who owns the farm adjoining the school property, needed an outlet for an open drain. So he and the school board agreed to make the conservation job a joint project. The outlet was constructed on Trombly's side of the boundary and the diversion on the school property.

As a result of "horse trading," Trombly paid the district for the contractor's equipment to build the outlet and the school paid for the hedgerow removal and the diversion. Rains just after construction proved the value of the diversion. Despite rain, the schoolyard stayed in good condition. Both the farmer and the school board were pleased with the results.

A 1,500-foot line of 4-inch tile is planned to give the best possible drainage. Schools have budget problems too, Principal Pilling pointed out. So the tile will have to wait a while.

The Chateaugay Central School has 20 acres of red pine planted by the district in 1961. Several thousand shrubs for wildlife food and cover were also furnished by the district and planted by school children.

A waterway constructed on the adjoining farm and now sodded provides outlet for diversion that protects school property.

Land Use Principles: A Reading and Discussion Guide. By Ben Osborn. *1968. USDA Graduate School Press, Washington, D. C. 39 pp. $1.25.*

This modest but excellent little treatise was developed for classes in the USDA Graduate School conducted in cooperation with the Audubon Naturalist Society, Washington, D. C. The treatise grew out of 9 years of field and class work and is a model of its kind. Although designed primarily for the use of classes and study groups interested in the subject, the booklet has considerable value for the individual interested in improving his knowledge and concepts of land use.

The reading and discussion outline offers a series of subjects, each with suggested reading. The subjects deal with the esthetic and ethical, economic, political, social, ecological, and physical aspects of land use. There is consideration of urban and suburban uses, land use planning, watersheds, river basins, and finally, general principles.

A third section contains 70 principles summarizing in brief, clear statements the seminar and class discussions of the readings outlined, plus a selected list of definitions of conservation. The Guide is a *must* for anyone working in, or interested in, conservation as applied to the use of land.—W. R. Van Dersal, *deputy administrator for management, SCS.*

From SOIL CONSERVATION 30: 39-40. September 1964.

America the Beautiful—CONTOUR STRIPCROPPING, HARFORD SOIL CONSERVATION DISTRICT—USDA: SCS MARYLAND

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